Amendments to the Claims:

Claim 1-125 (Canceled)

Please add the following claims.

126. (New) An intrinsically conductive copolymer, the copolymer having a conductivity ranging from 10^{-8} S/cm to 300 S/cm.

127. (New) The copolymer of claim 126, wherein the conductivity ranges from 10^{-8} S/cm to 150 S/cm.

128. (New) The copolymer of claim 126, wherein the conductivity ranges from 10^{-5} S/cm to 300 S/cm.

129. (New) The copolymer of claim 126, wherein the conductivity ranges from 10^{-5} S/cm to 150 S/cm.

130. (New) The copolymer of claim 126, wherein the conductivity ranges from 10^{-2} S/cm to 150 S/cm

131. (New) The copolymer of claim 126, wherein the conductivity ranges from 1 S/cm to 150 S/cm.

132. (New) The copolymer of claim 126, wherein the conductivity ranges from 5 S/cm to 150 S/cm.

133. (New) The copolymer of claim 126, wherein the conductivity ranges from 10 S/cm to 150 S/cm.

134. (New) The copolymer of claim 126, wherein the copolymer is a diblock copolymer.

135. (New) The copolymer of claim 126, wherein the copolymer is a triblock copolymer.

136. (New) The copolymer of claim 126, wherein the copolymer is a polyurethane copolymer.

137. (New) An electrically conductive or optically sensitive polymeric material formed from the method of claim 126.

138. (New) The copolymer of claim 126, wherein the copolymer has at least one intrinsically conducting polymer segment.

139. (New) The copolymer of claim 126, wherein the copolymer has at least one conducting segment selected from the group consisting of polythiophene, polypyrrole, poly-*p*-phenylenevinylene, and polyaniline.

140. (New) The copolymer of claim 126, wherein the copolymer includes a structural polymer comprising an ATRP-polymerizable segment.

141. (New) The copolymer of claim 126, wherein the copolymer includes a structural polymer selected from the group consisting of a polystyrene, a polyacrylate, and a polyurethane.

142. (New) An intrinsically conductive copolymer, the copolymer having a conductivity ranging from 10^{-8} S/cm to 300 S/cm, wherein the copolymer has at least one intrinsically conducting polymer segment, the copolymer including a structural polymer comprising an ATRP-polymerizable segment.

143. (New) The copolymer of claim 142, wherein the copolymer has at least one conducting segment selected from the group consisting of polythiophene, polypyrrole, poly-*p*-phenylenevinylene, and polyaniline, the copolymer including a structural polymer selected from the group consisting of a polystyrene, a polyacrylate, and a polyurethane.

144. (New) The copolymer of claim 142, wherein the conductivity ranges from 10^{-8} S/cm to 150 S/cm.

145. (New) The copolymer of claim 142, wherein the conductivity ranges from 10^{-5} S/cm to 300 S/cm.

146. (New) The copolymer of claim 142, wherein the conductivity ranges from 10^{-5} S/cm to 150 S/cm.

147. (New) The copolymer of claim 142, wherein the conductivity ranges from 10^{-2} S/cm to 150 S/cm

148. (New) The copolymer of claim 142, wherein the conductivity ranges from 1 S/cm to 150 S/cm.

149. (New) The copolymer of claim 142, wherein the conductivity ranges from 5 S/cm to 150 S/cm.

150. (New) The copolymer of claim 142, wherein the conductivity ranges from 10 S/cm to 150 S/cm.

151. (New) The copolymer of claim 142, wherein the copolymer is a diblock copolymer.

152. (New) The copolymer of claim 142, wherein the copolymer is a triblock copolymer.

153. (New) The copolymer of claim 142, wherein the copolymer is a polyurethane copolymer.

154. (New) An intrinsically conductive polythiophene copolymer, the copolymer having a conductivity ranging from 10^{-8} S/cm to 300 S/cm, wherein the copolymer is formed from the polymer having the structure:

wherein R is a substituent selected from the group consisting of alkyl, polyether, and aryl, X is a halogen, and n is greater than 1,

the polymer being formed from a polymerization reaction in major amounts of at least 90% by weight.

155. (New) The copolymer of claim 154, wherein the conductivity ranges from 10^{-8} S/cm to 150 S/cm.

156. (New) The copolymer of claim 154, wherein the conductivity ranges from 10^{-5} S/cm to 300 S/cm.

157. (New) The copolymer of claim 154, wherein the conductivity ranges from 10^{-5} S/cm to 150 S/cm.

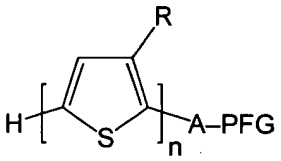
158. (New) The copolymer of claim 154, wherein the conductivity ranges from 10^{-2} S/cm to 150 S/cm

159. (New) The copolymer of claim 154, wherein the conductivity ranges from 1 S/cm to 150 S/cm.

160. (New) The copolymer of claim 154, wherein the conductivity ranges from 5 S/cm to 150 S/cm.

161. (New) The copolymer of claim 154, wherein the conductivity ranges from 10 S/cm to 150 S/cm.

162. (New) An intrinsically conductive polythiophene copolymer, the copolymer having a conductivity ranging from 10^{-8} S/cm to 300 S/cm, wherein the copolymer is formed from the polymer having the structure:



wherein PFG is a protected hydroxyl or amine functional group, and A is selected from the group consisting of alkyl and aromatic, the protected thiophene polymer formed from the polymer of claim 1.

163. (New) The copolymer of claim 162, wherein the conductivity ranges from 10^{-8} S/cm to 150 S/cm.

164. (New) The copolymer of claim 162, wherein the conductivity ranges from 10^{-5} S/cm to 300 S/cm.

165. (New) The copolymer of claim 162, wherein the conductivity ranges from 10^{-5} S/cm to 150 S/cm.

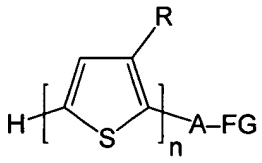
166. (New) The copolymer of claim 162, wherein the conductivity ranges from 10^{-2} S/cm to 150 S/cm

167. (New) The copolymer of claim 162, wherein the conductivity ranges from 1 S/cm to 150 S/cm.

168. (New) The copolymer of claim 162, wherein the conductivity ranges from 5 S/cm to 150 S/cm.

169. (New) The copolymer of claim 162, wherein the conductivity ranges from 10 S/cm to 150 S/cm.

170. (New) An intrinsically conductive polythiophene copolymer, the copolymer having a conductivity ranging from 10^{-8} S/cm to 300 S/cm, wherein the copolymer is formed from the polymer having the structure:



wherein R is selected from the group consisting of alkyl, polyether, and aryl; n is greater than 1; A is selected from the group consisting of alkyl and aromatic, and FG is a functional group selected from the group consisting of primary alkyl amine and primary alcohol,

171. (New) The copolymer of claim 170, wherein the conductivity ranges from 10^{-8} S/cm to 150 S/cm.

172. (New) The copolymer of claim 170, wherein the conductivity ranges from 10^{-5} S/cm to 300 S/cm.

173. (New) The copolymer of claim 170, wherein the conductivity ranges from 10^{-5} S/cm to 150 S/cm.

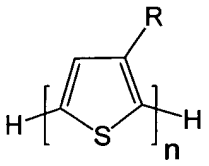
174. (New) The copolymer of claim 170, wherein the conductivity ranges from 10^{-2} S/cm to 150 S/cm

175. (New) The copolymer of claim 170, wherein the conductivity ranges from 1 S/cm to 150 S/cm.

176. (New) The copolymer of claim 170, wherein the conductivity ranges from 5 S/cm to 150 S/cm.

177. (New) The copolymer of claim 170, wherein the conductivity ranges from 10 S/cm to 150 S/cm.

178. (New) An intrinsically conductive polythiophene copolymer, the copolymer having a conductivity ranging from 10^{-8} S/cm to 300 S/cm, wherein the copolymer is formed from the polymer having the structure:



wherein R is a substituent selected from the group consisting of alkyl, polyether, and aryl, and n is greater than 1,

the polymer being formed from a polymerization reaction in major amounts of at least 90% by weight.

179. (New) The copolymer of claim 178, wherein the conductivity ranges from 10^{-8} S/cm to 150 S/cm.

180. (New) The copolymer of claim 178, wherein the conductivity ranges from 10^{-5} S/cm to 300 S/cm.

181. (New) The copolymer of claim 178, wherein the conductivity ranges from 10^{-5} S/cm to 150 S/cm.

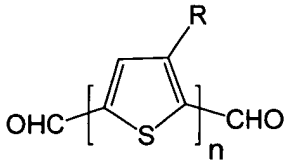
182. (New) The copolymer of claim 178, wherein the conductivity ranges from 10^{-2} S/cm to 150 S/cm

183. (New) The copolymer of claim 178, wherein the conductivity ranges from 1 S/cm to 150 S/cm.

184. (New) The copolymer of claim 178, wherein the conductivity ranges from 5 S/cm to 150 S/cm.

185. (New) The copolymer of claim 178, wherein the conductivity ranges from 10 S/cm to 150 S/cm.

186. (New) An intrinsically conductive polythiophene copolymer, the copolymer having a conductivity ranging from 10^{-8} S/cm to 150 S/cm, wherein the copolymer is formed from the polymer having the structure:



wherein R is a substituent selected from the group consisting of alkyl, polyether, and aryl, and n is greater than 1.

187. (New) The copolymer of claim 186, wherein the conductivity ranges from 10^{-8} S/cm to 150 S/cm.

188. (New) The copolymer of claim 186, wherein the conductivity ranges from 10^{-5} S/cm to 300 S/cm.

189. (New) The copolymer of claim 186, wherein the conductivity ranges from 10^{-5} S/cm to 150 S/cm.

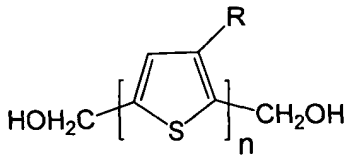
190. (New) The copolymer of claim 186, wherein the conductivity ranges from 10^{-2} S/cm to 150 S/cm

191. (New) The copolymer of claim 186, wherein the conductivity ranges from 1 S/cm to 150 S/cm.

192. (New) The copolymer of claim 186, wherein the conductivity ranges from 5 S/cm to 150 S/cm.

193. (New) The copolymer of claim 186, wherein the conductivity ranges from 10 S/cm to 150 S/cm.

194. (New) An intrinsically conductive copolymer, the copolymer having a conductivity ranging from 10^{-8} S/cm to 300 S/cm, wherein the copolymer is formed from a poly-(3-substituted) thiophene diol having the structure:



wherein R is a substituent selected from the group consisting of alkyl, polyether, and aryl, and n is greater than 1.

195. (New) The copolymer of claim 194, wherein the conductivity ranges from 10^{-8} S/cm to 150 S/cm.

196. (New) The copolymer of claim 194, wherein the conductivity ranges from 10^{-5} S/cm to 300 S/cm.

197. (New) The copolymer of claim 194, wherein the conductivity ranges from 10^{-5} S/cm to 150 S/cm.

198. (New) The copolymer of claim 194, wherein the conductivity ranges from 10^{-2} S/cm to 150 S/cm

199. (New) The copolymer of claim 194, wherein the conductivity ranges from 1 S/cm to 150 S/cm.

200. (New) The copolymer of claim 194, wherein the conductivity ranges from 5 S/cm to 150 S/cm.

201. (New) The copolymer of claim 194, wherein the conductivity ranges from 10 S/cm to 150 S/cm.